



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064**

November 1, 2002

EA-02-158

Gregory M. Rueger, Senior Vice
President, Generation and Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Power Plant
P.O. Box 3
Avila Beach, California 93424

**SUBJECT: DIABLO CANYON - NRC INTEGRATED INSPECTION REPORT 50-275/02-04;
50-323/02-04**

Dear Mr. Rueger:

On October 5, 2002, the NRC completed an inspection at your Diablo Canyon Nuclear Power Plant, Units 1 and 2, facility. The enclosed integrated report documents the inspection findings that were discussed on July 25, August 7, and October 5, 2002 with David H. Oatley and members of your staff as discussed in Section 40A6.

This inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, two violations of NRC requirements were identified. The first violation was categorized at Security Level IV (EA 02-158) and the second violation was evaluated under the risk significance determination process as having very low significance (Green). The NRC is treating these violations as noncited violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you contest these noncited violations or their significance, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Diablo Canyon Power Plant.

Pacific Gas and Electric Company operated under voluntary bankruptcy proceedings during this inspection period. The NRC has monitored plant operations, maintenance, and planning to better understand the impact of the financial situation and how it relates to your responsibility to safely operate the Diablo Canyon reactors. NRC inspections, to date, have confirmed that you are operating these reactors safely and that public health and safety is assured.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

William B. Jones, Chief
Project Branch E
Division of Reactor Projects

Dockets: 50-275
50-323

Licenses: DPR-80
DPR-82

Enclosure:
NRC Inspection Report
50-275/02-04; 50-323/02-04

cc w/enclosure:
David H. Oatley, Vice President
Diablo Canyon Operations and Plant Manager
Diablo Canyon Power Plant
P.O. Box 56
Avila Beach, California 93424

Lawrence F. Womack, Vice President, Power
Generation & Nuclear Services
Diablo Canyon Power Plant
P.O. Box 56
Avila Beach, California 93424

Dr. Richard Ferguson
Energy Chair
Sierra Club California
1100 11th Street, Suite 311
Sacramento, California 95814

Nancy Culver
San Luis Obispo Mothers for Peace
P.O. Box 164
Pismo Beach, California 93448

Chairman
San Luis Obispo County Board of
Supervisors
Room 370
County Government Center
San Luis Obispo, California 93408

Truman Burns\Mr. Robert Kinosian
California Public Utilities Commission
505 Van Ness, Rm. 4102
San Francisco, California 94102

Robert R. Wellington, Esq.
Legal Counsel
Diablo Canyon Independent Safety Committee
857 Cass Street, Suite D
Monterey, California 93940

Ed Bailey, Radiation Control Program Director
Radiologic Health Branch
State Department of Health Services
P.O. Box 942732 (MS 178)
Sacramento, California 94234-7320

Christopher J. Warner, Esq.
Pacific Gas and Electric Company
P.O. Box 7442
San Francisco, California 94120

City Editor
The Tribune
3825 South Higuera Street
P.O. Box 112
San Luis Obispo, California 93406-0112

James D. Boyd, Commissioner
California Energy Commission
1516 Ninth Street (MS 34)
Sacramento, California 95814

Technical Services Branch Chief
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Dockets: 50-275
50-323

Licenses: DPR-80
DPR-82

Report No: 50-275/02-04
50-323/02-04

Licensee: Pacific Gas and Electric Company

Facility: Diablo Canyon Nuclear Power Plant, Unit 1 and 2

Location: 7 ½ miles NW of Avila Beach
Avila Beach, California

Dates: July 7 through October 5, 2002

Inspectors: D. L. Proulx, Senior Resident Inspector
T. W. Jackson, Resident Inspector
J. S. Dodson, Project Engineer
L. T. Ricketson, P.E., Senior Health Physicist
J. S. Drake, Reactor Inspector
W.C. Sifre, Reactor Inspector

Approved By: W. B. Jones, Chief, Projects Branch E
Division of Reactor Projects

ATTACHMENTS:

Attachment Supplemental Information

SUMMARY OF FINDINGS

IR 05000-275-02-04, IR 05000-323-02-04, Pacific Gas and Electric. Co., 07/07/02 to 10/05/02, Diablo Canyon Nuclear Power Plant Units 1 and 2. ALARA Planning and Controls, Problem Identification and Resolution.

This report covers a 13-week routine resident, radiation protection, and maintenance effectiveness inspection. The inspection identified two Green noncited violations. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the Significance Determination Process does not apply are indicated by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- Green. A violation of Technical Specification 5.4.1.a occurred for failure to follow a maintenance procedure for torquing atmospheric dump Valve PCV-21 bonnet cover bolts. The maintenance procedure required incrementally torquing the studs and nuts using a calibrated torque wrench. However, the mechanics willfully violated the procedure by using a hammer and extender to tighten the bolts, resulting in cracking of seven out of eight of the stud and nut combinations (EA 02-158).

This Severity Level IV violation is being treated as a noncited violation consistent with Section VI.A.1 of the NRC Enforcement Policy. Although this violation was willful, the licensee promptly reported the results of the investigation to the NRC, the acts were committed by low level individuals, management was not involved nor was the action due to lack of management oversight, and the licensee took significant remedial action. The inspectors evaluated the as-found condition of the studs and nuts on Atmospheric Dump Valve PCV-21 using the Significance Determination Process. The inspectors determined that the multiple stud and nut failures represented a credible impact on safety in that their failure could have resulted in the body-to-bonnet separation of Valve PCV-21. The failure would have been similar to a failed open atmospheric dump or secondary safety relief valve. The inspectors considered that the failure of the degraded studs would result in a potential loss of the main steam boundary and a direct release path following a postulated Unit 2 Steam Generator 3 tube rupture. Although the condition resulted in a minor steam leak, the licensee completed a metallurgical analysis that demonstrated the remaining studs and nuts had sufficient strength, along with the stud configuration around the valve bonnet, to prevent catastrophic failure of Valve PCV-21. No immediate operability concerns were identified for any of the other atmospheric dump valves. Based on the determination that the valve body and bonnet would not have separated, the inspectors concluded the issue had very low safety significance (Section 40A2).

Cornerstone: Occupational Radiation Safety [OS]

- Green. The inspectors identified a noncited violation of 10 CFR 20.1902 because the licensee failed to post radiation areas. Specifically, the licensee did not post two discrete areas within Vault 26 in which the radiation dose rates were approximately 10 millirem per hour at 30 centimeters from the surfaces of radioactive material storage containers. Radiation area means an area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 5 millirem in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

The failure to post a radiation area is a performance deficiency. The finding was more than minor because it was associated with one of the cornerstone attributes (exposure control and monitoring) and the finding affected the Occupational Radiation Safety cornerstone objective (adequate protection from exposure). Because the finding involved the potential for unplanned, unintended dose resulting from conditions that were contrary to NRC regulations, the finding was evaluated using the Occupational Radiation Safety Significance Determination Process. The inspector determined that the finding had no more than very low safety significance because it did not involve as low as reasonably achievable (ALARA) planning and controls, there was no personnel overexposure, there was no substantial potential for personnel overexposure, and the finding did not compromise the licensee's ability to assess dose (Section 2OS2).

Report Details

Summary of Plant Status

Diablo Canyon Unit 1 began this inspection period at 100 percent power. On July 12, 2002, operators commenced a unit down-power to 15 percent power and separated the Unit 1 main generator from the grid. The purpose of the down-power was to accommodate maintenance for reducing turbine bearing vibration. Upon completion of maintenance activities, operators re-synchronized the main generator to the grid and returned the unit to 100 percent power on July 14. On August 6, operators reduced power to approximately 83.5 percent due to high current transformer vibrations. The administrative limit for current transformer vibrations was raised from 15 mils to 18 mils, and reactor power was returned to 100 percent power on August 7. On August 9, operators reduced power to 15 percent to perform a balance shot of the Unit 1 main turbine. Following the balance shot, operators began increasing reactor power. When reactor power reached 87 percent, high current transformer vibration prompted operators to reduce power back to 15 percent to perform another balance shot. On August 11, while performing the Unit 1 main turbine balance shot, maintenance personnel discovered that the balance shot could not be performed without securing oil systems and the main condenser. On August 12, operators paralleled Unit 1 to the grid, and increased reactor power to 100 percent on August 14. On August 22, operators reduced power to 92 percent as a result of main turbine Bearing 9 high vibration. On August 23, operators further reduced power to 15 percent to perform a balance shot of main turbine Bearing 9. Following the balance shot, operators increased reactor power. Power was limited to 98 percent in order to maintain current transformer and main turbine Bearing 9 vibration below administrative limits. Unit 1 remained at 98 percent power until the end of the inspection period.

Diablo Canyon Unit 2 began this inspection period at 100 percent power. On September 19, 2002, operators reduced power to 50 percent to support Midway switchyard work. Following the switchyard work, operators returned power to 100 percent on September 20. Unit 2 remained at 100 percent power for the rest of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness

1R01 Adverse Weather Protection (711111.01)

From July 19 to September 24, 2002, the inspectors reviewed the design features, equipment, and plant preparation for protecting mitigating systems from the adverse effects of Pacific Ocean storms. These storms, in conjunction with kelp and other aquatic plants, can obstruct the intake traveling screens, causing a trip of the circulating water pumps and loss of the main condenser. In the past, these storms, also known as "kelp attacks," have caused the shutdown of both units within a short period of each other due to a loss of normal heat sink. Sample reviews of the traveling screen, screen refuse, and circulating water systems were conducted to support the scope of this inspection activity.

.1 Units 1 and 2 Bar Rack/Traveling Screen System

a. Inspection Scope

The bar racks and traveling screens prevent solid material (kelp, trash, etc.) from being ingested into the pumps located at the intake. The inspectors walked down the bar racks and traveling screens at the intake structure to observe their operational readiness. During the walkdown, the inspectors reviewed the condition of mechanical and electrical components, lubrication, and the functionality of support systems. Additionally, the inspectors reviewed corrective action documents related to the traveling screen system, to verify that appropriate corrective maintenance was being pursued. The inspectors used the following documentation:

- Procedure AR PK13-01, "Bar Racks/Screens (Unit 1)," Revision 17
- Procedure AR PK13-01, "Bar Racks/Screens (Unit 2)," Revision 6
- Action Requests (ARs): A0467127, A0526673, A0535980, A0504154, A0548397, A0380253, and A0398853
- Drawing OVID 106717, "Saltwater System,"
 - Sheet 7, Revision 119
 - Sheet 7A, Revision 116

b. Findings

No findings of significance were identified.

.2 Units 1 and 2 Screen Refuse System

a. Inspection Scope

The screen refuse system pumps kelp and other material that has been washed from the traveling screens back to the ocean, at a location away from the intake. The inspectors walked down the screen refuse system at the intake structure to observe their operational readiness. During the walkdown, the inspectors considered the condition of mechanical and electrical components and lubrication.

b. Findings

No findings of significance were identified.

.3 Units 1 and 2 Circulating Water System

a. Inspection Scope

The circulating water system provides cooling water from the Pacific Ocean for the main condensers. Each main condenser is supplied by two circulating water pumps. The

inspectors walked down the circulating water pumps and reviewed the corrective action program for any outstanding corrective maintenance that might impact the circulating water system during the Pacific Ocean storms.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments (71111.04)

Complete System Walkdown

Units 1 and 2 Vital DC Power System

a. Inspection Scope

The inspectors performed a complete system walkdown of the Unit 1 DC Power System on July 9, 2002, and the Unit 2 DC Power System on July 10. The inspectors conducted the walkdown to verify correct system alignment and evaluate the condition of support systems; review outstanding deficiencies associated with the system, and compare the actual system with descriptions in procedures, drawings, and vendor manuals. The following documents were used during the inspection:

- Technical Specifications, "Electrical Power Systems," Section 3.8
- Final Safety Analysis Report (FSAR) Update, "DC Power Systems," Section 8.3.2
- FSAR Update, "125-VDC and 480-VAC Switchgear Area," Section 9.4.9
- Design Criteria Memorandum No. S-67, "125/250 Volt Direct Current System," Revision 13
- Procedure OP AP-23, "Loss of Vital DC Bus," Revision 10
- Procedure OP J-9, Unit 1, "Operating Procedure 125/250V DC System," Revision 5
- Procedure OP J-9, Unit 2, "Operating Procedure 125/250V DC System," Revision 1
- Station vital 125 VDC surveillance tests
 - Procedure STP M-11A, "Measurement of Station Battery Pilot Cell Voltage and Specific Gravity," Revision 16
 - Procedure STP M-11B, "Measurement of Station Battery Voltage and Specific Gravity," Revision 21

- Procedure STP M-11C, "Terminal Resistance Measurement and Inspection for Vital Station Batteries," Revision 14A
- Procedure STP M-12B, "Battery Charger Performance Test," Revision 11
- Procedure STP M-12A, "Vital Station Battery Modified Performance Test," Revision 10
- ARs: A0531229, A0531438, A0536376, A0536472, A0538566, A0539509, A0540989, A0543244, A0549601, A0549696, A0551663, A0552376, A0555036, and A0555059

b. Findings

No findings of significance were identified.

Partial System Walkdowns

.1 Unit 1, Component Cooling Water System, Train A

a. Inspection Scope

On July 17, 2002, with Component Cooling Water Pump (CCW) 1-1 in a maintenance outage window, the inspectors reviewed the CCW System Train A for proper system alignment. The inspectors observed valve alignment, labeling, lubrication, ventilation, seismic supports, and absence of obstructions that may prevent the pump from performing its safety function. The inspectors also considered the availability of electrical power and the proper working condition of associated electrical equipment. The following documents were used during the inspection:

- Procedure OP F-2:VI, "CCW System Alignment Verification for Plant Startup," Revision 26
- Drawing OVID 106714, "Component Cooling Water,"
 - Sheet 2, Revision 45
 - Sheet 3, Revision 49
 - Sheet 9, Revision 49

b. Findings

No findings of significance were identified.

.2 Unit 1, Auxiliary Saltwater Pump 1-1

a. Inspection Scope

On August 13-15, 2002, with maintenance scheduled for Auxiliary Saltwater Pump 1-2, the inspectors reviewed the Auxiliary Saltwater Pump 1-1, and its associated valves,

fuses, and breakers for proper alignment. The inspectors observed valve alignment, labeling, lubrication, ventilation, seismic supports, and the absence of obstructions that may prevent the system from performing its function. The inspectors also reviewed the alignment of breakers and fuses supplying electrical power and the proper working condition of associated electrical equipment. The following documents were used during the inspection:

- Procedure OP-5:I, "Auxiliary Saltwater System - Make Available," Revision 24A
- Procedure OP-5:IV, "ASW - Changing Over Pump and Heat Exchanger Trains," Revision 6A
- Drawing OVID 106717, "Saltwater"
 - Sheet 7, Revision 119
 - Sheet 8, Revision 117

b. Findings

No findings of significance were identified.

.3 Unit 2, Safety Injection Pump 2-1

a. Inspection Scope

On August 28, 2002, with Safety Injection Pump 2-2 in a maintenance outage window, the inspectors reviewed the system alignment of Safety Injection Pump 2-1. The inspectors observed valve alignment, labeling, lubrication, ventilation, seismic supports, and absence of obstructions that may prevent the pump from performing its safety function. The inspectors also considered the availability of electrical power and the proper working condition of associated electrical equipment. The following documents were used during the inspection:

- Procedure OP B-3:II, "Safety Injection System Alignment Verification for Plant Startup," Revision 15A
- Drawing OVID 107709, "Safety Injection," Sheet 4, Revision 43

c. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Observations

a. Inspection Scope

The inspectors performed eight fire protection walkdowns to assess the material condition of plant fire detection and suppression, fire seal operability, and proper control of transient combustibles. The inspectors used Section 9.5 of the FSAR Update as guidance. The inspectors considered whether the suppression equipment and fire doors complied with regulatory requirements and conditions specified in Procedures STP M-69A, "Monthly Fire Extinguisher Inspection," Revision 31B, STP M-69B, "Monthly CO2 Hose Reel and Deluge Valve Inspection," Revision 14, and STP M-70C, "Inspection/Maintenance of Doors," Revision 6. Specific risk-significant areas inspected included:

- Intake structure (Units 1 and 2)
- Radiologically controlled area of the auxiliary building (Units 1 and 2)
- Diesel engine generator rooms of the turbine building (Units 1 and 2)
- Switchgear rooms of the auxiliary building (Units 1 and 2)

b. Findings

No findings of significance were identified.

1R06 Flood Protection (71111.06)

.1 Annual Inspection

a. Inspection Scope

The inspectors reviewed the licensee's flood protection measures for Units 1 and 2 with respect to heavy rains. The inspectors reviewed the licensee's probabilistic risk assessment for external flooding, Chapter 3 of the FSAR Update, and past experience with external floods. In particular, the inspectors observed cable pull boxes and the cable rooms below the 12kV switchgear rooms for both units.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Inspection

a. Inspection Scope

The inspectors reviewed the licensee's flood protection measures for Unit 2 to ensure that the licensee had taken adequate precautions to mitigate an internal and external flood risks. The inspectors reviewed the licensee's probabilistic risk assessment for

external and internal flooding, Chapter 3 of the FSAR Update, and applicable controlled drawings in support of this inspection. The inspectors toured the auxiliary building to ensure that flood protection boundaries were functional.

b. Findings

No findings of significance were identified.

1R11 Operator Requalification (71111.11)

a. Inspection Scope

The inspectors witnessed operator performance in the simulator during routine training and requalification examinations. The inspectors also attended the crew and individual debriefs to determine if the evaluators critically assessed operator performance. On August 27, 2002, the inspectors observed a simulator scenario associated with turbine generator radiofrequency trouble, failure of a charging flow transmitter, a safety injection accumulator leak, closure of a main feedwater regulating valve, a reactor trip, and an unisolable reactor coolant system leak. The inspectors used the following procedures to support the inspection activities:

- EOP E-0, "Reactor Trip or Safety Injection," Revision 27
- OP AP-1, "Excessive Reactor Coolant System Leakage," Revision 14
- OP AP-17, "Loss of Charging," Revision 22
- OP L-4 "Normal Operation at Power," Revision 51

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Reviews

a. Inspection Scope

The inspectors reviewed the licensee's Maintenance Rule implementation for equipment performance problems. The inspectors assessed whether the equipment was properly placed into the scope of the rule, whether the failures were properly characterized, and whether goal setting was recommended, if required. Procedure MA1.ID17, "Maintenance Rule Monitoring Program," Revision 9, was used as guidance. The inspectors reviewed the following ARs:

- A0545965, Evaluate DG PC1 Maintenance Rule limit (Unit 1)
- A0467127, Maintenance Rule performance criteria, goal setting review (Unit 1)

- A0560188, Maintenance Rule performance criteria, goal setting review for Battery Charger 1-2 (Unit 1)
- A0560825, Maintenance Rule performance criteria, goal setting review for component cooling water system (Unit 1)

b. Findings

No findings of significance were identified.

.2 Biennial Periodic Evaluation

a. Inspection Scope

The inspectors reviewed the Diablo Canyon Power Plant report documenting the performance of the last Maintenance Rule periodic effectiveness assessment. This periodic evaluation covered the period from November 1999 through August 2002.

The inspectors reviewed that the program for the monitoring of risk-significant functions associated with structures, systems, and components using reliability and unavailability. Additionally, the performance of nonrisk-significant functions were monitored using plant level criteria.

The inspectors reviewed the conclusions reached by licensee personnel with regard to the balance of reliability and unavailability for specific Maintenance Rule functions. This review was conducted by examining the licensee's evaluation of all risk-significant functions that had exceeded performance criteria during the evaluation period.

The inspectors also examined Diablo Canyon Power Plant personnel's evaluation of program activities associated with the placement of Maintenance Rule Program functions in Categories (a)(1) or (a)(2). Additionally, the inspectors reviewed the periodic evaluation conclusions reached by Diablo Canyon Power Plant personnel for the following systems: containment isolation valves, component cooling water, fire protection, reactor head vent valves, control room ventilation, control room main annunciators, and postaccident sampling system.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

.1 Risk Assessments

a. Inspection Scope

The inspectors reviewed daily work schedules and compensatory measures to confirm that the licensee had performed proper risk management for routine and emergent

work. The inspectors considered whether risk assessments were performed according to their procedures and the licensee had properly used their risk-assessment tools. The inspectors reviewed the licensee's entry into appropriate risk categories, preservation of key safety functions, and implementation of work controls. The inspectors used Procedure AD7.DC6, "On-line Maintenance Risk Management," Revision 6, as guidance. The inspectors specifically observed the following work activities during the inspection period:

- Unit 2, Safety Injection Pump 2-2 maintenance outage window on August 28, 2002
- Unit 1, Startup Transformer 1-1 maintenance outage window on September 16-21, 2002
- Unit 2, Diesel Fuel Oil Transfer Pump 0-2 maintenance outage window on October 1, 2002

b. Findings

No findings of significance were identified.

.2 Emergent Work

a. Inspection Scope

The inspectors observed emergent work activities to verify that actions were taken to minimize the probability of initiating events, maintain the functional capability of mitigating systems, and maintain barrier integrity. The scope of work activities reviewed includes troubleshooting, work planning, plant conditions and equipment alignment, tagging and clearances, and temporary modifications. The following activities were observed during this inspection period:

- Unit 1, Auxiliary feedwater system chloride contamination on July 29, 2002
- Unit 1, Reactor power changes due to main turbine high vibration for the month of August 2002
- Unit 1, Auxiliary Saltwater Pump 1-2 motor replacement on August 27-28, 2002
- Unit 2, Component Cooling Water Pump 2-3 cable replacement on August 18-23, 2002

b. Findings

Introduction

On August 18, 2002, the licensee identified a ground on the power supply cable for CCW Pump 2-3. Using time delayed refractometry, the licensee found that the ground

existed approximately 91 feet from the motor termination. The licensee determined that operability of CCW Pump 2-3 could not be assured with the existence of the ground, and declared the pump inoperable.

Description

Planners estimated to remove, replace and test a new cable would take approximately 100 hours. Technical Specification 3.7.7 states, in part that with one CCW pump inoperable, restore the pump to operable status within 72 hours, or place the unit in Mode 3 within the next 6 hours. The licensee evaluated the safety implications and the risk of continuing to operate while replacing the power supply cable for CCW Pump 2-3, and determined that such an evolution would have very low safety significance.

On August 21, 2002, the licensee requested and received staff approval for a Notice of Enforcement Discretion (NOED) to not enforce the shutdown provisions of Technical Specification 3.7.7 for an additional 72 hours during replacement of the power supply cable for CCW Pump 2-3. The licensee completed the replacement, retested the pump, and declared it operable on August 23.

Analysis

The extension of Technical Specification 3.7.7 for an additional 72 hours to provide restoration of CCW Pump 2-3 was evaluated by an NRC senior reactor analyst and determined to be of very low safety significance (Green). The senior reactor analyst found the safety significance determination documented in the licensee's request for enforcement discretion to be appropriate.

Enforcement

The inspectors reviewed the root causes of the cable failure and noted that the licensee had experienced seven medium voltage cable failures since 1989. The inspectors will perform further review to assess the adequacy of corrective actions for past cable failures and determine whether the past actions should have precluded the failure of the power supply cable for CCW Pump 2-3. This is an unresolved item (URI) (URI 323/2002004-01).

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed operability evaluations and supporting documents to determine if the associated systems could meet their intended safety functions despite the degraded status. The inspectors reviewed the applicable Technical Specifications, Codes/Standards, and FSAR Update sections in support of this inspection. The inspectors reviewed the following ARs:

- Unit 2, A0471001, "CSP 2-1: Eval. Teflon Used in Seal Tubing and Oilers"
- Unit 1, A0436116, "CCP 1-1 Inboard/Outboard Seal Leakage"

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

The inspectors reviewed Design Change Package DCP-E-49462, "Separate Wiring for Lockout Relays." The inspectors reviewed the design change package for technical adequacy and reviewed the applicable safety evaluation. In addition, the inspectors performed a sample inspection of the modification in the field.

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

c. Inspection Scope

The inspectors reviewed postmaintenance tests for selected risk-significant systems to verify their operability and functional capability. As part of the inspection process, the inspectors witnessed and/or reviewed the postmaintenance test acceptance criteria and results. The test acceptance criteria was compared to the Technical Specifications and the FSAR Update for the Diablo Canyon Power Plant. Additionally, the inspectors reviewed that the test was adequate for the scope of work, the test was performed as prescribed, jumpers and test equipment were properly removed after the test, and test equipment range, accuracy, and calibration were consistent for the application. The following are selected corrective maintenance activities reviewed by the inspectors:

- Unit 1, Eagle 21 - Rack 03, Replace nonvolatile RAM on July 18, 2002
- Unit 2, Auxiliary Feedwater Pump 2-2, maintenance outage window on August 1, 2002
- Unit 1, Diesel Fuel Oil Transfer Pump 0-1, maintenance outage window on August 27, 2002
- Unit 2, Auxiliary Building Ventilation System Charcoal Filter Bank EFC-1 replacement on August 28, 2002
- Unit 1, Auxiliary Saltwater Pump 1-2 motor replacement on August 28-29, 2002
- Unit 2, Residual Heat Removal Heat Exchanger 2-1 Component Cooling Water Flow Control Valve FCV-365 solenoid replacement on September 5-6, 2002

- Unit 1, Startup Transformer 1-1 six year maintenance outage window on September 16-21, 2002

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

Routine Observations

a. Inspection Scope

The inspectors evaluated several routine surveillance tests to determine if the licensee complied with the applicable Technical Specification requirements to demonstrate that equipment was capable of performing its intended safety functions and operational readiness. The inspectors performed a technical review of the procedure, witnessed portions of the surveillance test, and reviewed the completed test data. The inspectors also reviewed that proper test equipment was utilized, there was no preconditioning, test acceptance criteria agreed with the equipment design basis, and equipment is returned to normal alignment following the test. The following tests were evaluated during the inspection period:

- Procedure STP P-RHR-12, "Routine Surveillance Test of RHR Pump 1-2," Revision 13, on August 30, 2002, for Unit 1
- Procedure STP V-3S5, "Exercising Phase A Containment Isolation Valves (ECCS Test)," Revision 9, on August 30, 2002, for Unit 1
- Procedure STP I-2B, "Nuclear Power Range Channel Analog Channel Operational Test," Revision 28, on September 3, 2002, for Unit 1

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the following temporary modifications/plant jumpers. The inspectors reviewed the 10 CFR 50.59 screenings and verified that the applicable drawings were annotated. The inspectors also observed the required tag information and placement and, if required, that transient combustible administrative controls were properly implemented. The temporary alterations were performed in accordance with Procedure CF4.ID7, "Temporary Modifications," Revision 9A.

- Temporary Modification TP TC-0201, "Injection of Argon Gas into the Reactor Coolant System"

b. Findings

No findings of significance were identified.

1EP6 Emergency Preparedness Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors witnessed the emergency preparedness drill conducted on September 19, 2002. The challenging scenario consisted of a loss of Vital 4kV Bus H, a small break loss of coolant accident, loss of high head injection, subsequent core damage, and a hydrogen burn that causes a breach of containment at the penetration area of the auxiliary building. The inspectors witnessed the licensee's performance in the control room (simulator), the technical support center, and the operations support center. The inspectors also attended the licensee's self-critique of the drill. The following procedures were used to evaluate the drill performance:

- EP G-1, "Emergency Classification and Emergency Plan Activation," Revision 31
- EP G-2, "Activation and Operation of the Interim Site Emergency Organization," Revision 25
- EP G-3, "Notification of Off-Site Agencies and Emergency Response Organization Personnel," Revision 39
- EP RB-10, "Protective Action Recommendations," Revision 8

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety [OS]

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope

The inspectors interviewed radiation workers and radiation protection personnel involved in high dose rate and high exposure jobs in the radiologically controlled area during routine operations. Independent radiation surveys of selected work areas within the radiologically controlled area were conducted. No high exposure jobs or work in high radiation areas was performed during the inspection. The following items were reviewed and compared with regulatory requirements:

- ALARA program procedures
- Processes used to estimate and track exposures
- Plant collective exposure history for the past 3 years, current exposure trends, and 3-year rolling average dose information
- Five radiation work permit packages from Refueling Outage 1R11 (02-1002, "Scaffolding;" 02-1025, "Reactor Head Maintenance;" 02-1042, "Steam Generator Nozzle Dam Installation and Removal;" 02-1046, "Steam Generator Secondary Side Cleaning and Inspection;" and 02-1062, "Containment Valves and Breaches")
- Five postjob reviews (work activities listed above)
- Refueling Outage 1R11 Report
- Use of engineering controls to achieve dose reductions
- Radiological work planning
- Individual exposures of scaffold builders
- ALARA Committee meeting minutes and presentations (March 20, 2002, May 10, 2002, and June 11, 2002)
- Declared pregnant worker dose monitoring controls
- Selected corrective action documentation involving higher than planned exposure levels and radiation worker practice deficiencies since the last inspection in this area (A0554991, A0552842, A0556813, A0557219, and A0559744)
- 1R11 Radiation Protection Performance Assessment (June 5, 2002)

b. Findings

Failure to post a radiation area

Introduction

The inspectors identified a noncited violation (NCV) with very low safety significance (Green) because the licensee failed to post a radiation area.

Description

On July 25, 2002, the inspectors and a licensee representative toured the 115-foot yard area. Inside Vault 26, the inspector identified, through independent measurements, two

areas in which the radiation dose rates were approximately 10 millirem per hour at 30 centimeters from the surfaces of two different radioactive material containers. The dose rates were confirmed by the licensee's instruments. The inspectors observed that neither the discrete areas nor the open entrance to Vault 26 were posted as radiation areas, although the auxiliary building doorway to the yard was posted as a radiation area.

The inspectors reviewed the applicable guidance in NUREG/CR-5569, Revision 1, Health Physics Positions 036, "Posting of Entrances to a Large Room or Building as a Radiation Area," and 066, "Guidance for Posting Radiation Areas." Because the yard area was large and very little of it was a radiation area, the inspector concluded that posting on the doorway to the yard rather than the discrete areas was not sufficient to inform radiation workers of radiological hazards in their work areas.

Analysis

The failure to post a radiation area is a performance deficiency. The finding was more than minor because it was associated with one of the cornerstone attributes (exposure control and monitoring) and the finding affected the Occupational Radiation Safety cornerstone objective (adequate protection from exposure). Because the finding involved the potential for unplanned, unintended dose resulting from conditions that were contrary to NRC regulations, the finding was evaluated using the Occupational Radiation Safety Significance Determination Process. The inspector determined that the finding had no more than very low safety significance because it did not involve ALARA planning and controls, there was no personnel overexposure, there was no substantial potential for personnel overexposure, and the finding did not compromise the licensee's ability to assess dose.

Enforcement

10 CFR 20.1003 defines a radiation area as an area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 5 millirem in an hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates. 10 CFR 20.1902 requires each radiation area be posted with a conspicuous sign or signs. This violation is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Action Request A0562085 (NCV 50-275/2002004-02).

3. SAFEGUARDS

Cornerstone: Physical Protection (PP)

3PP3 Response to Contingency Events (71130.03)

The Office of Homeland Security (OHS) developed a Homeland Security Advisory System (HSAS) to disseminate information regarding the risk of terrorist attacks. The HSAS implemented five color-coded threat conditions with a description of corresponding actions at each level. NRC Regulatory Information Summary (RIS)

2002-12a, dated August 19, 2002, "NRC Threat Advisory and Protective Measures System," discusses the HSAS and provides additional information on protective measures to licensees.

a. Inspection Scope

On September 10, 2002, the NRC issued a Safeguards Advisory to reactor licensees to implement the protective measures described in RIS 2002-12a in response to the Federal government declaration of threat level "orange." Subsequently, on September 24, 2002, the OHS downgraded the national security threat condition to "yellow" and a corresponding reduction in the risk of a terrorist threat.

The inspector interviewed licensee personnel and security staff, observed the conduct of security operations, and assessed licensee implementation of the threat level "orange" protective measures. Inspection results were communicated to the region and headquarters security staff for further evaluation.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

40A1 Performance Indicator Verification (71151)

.1 Reactor Safety Performance Indicator Verification

a. Inspection Scope

The inspectors reviewed the following performance indicators for the period from the fourth quarter of 2001 through the third quarter of 2002 to assess the accuracy and completeness of the indicator. The inspectors reviewed plant operating logs and licensee monthly operating reports to support this inspection. The inspectors used NEI 99-02, "Regulatory Assessment Performance Indicator Verification," Revision 2, as guidance for this inspection.

- Reactor coolant system leakage rate
- Reactor coolant system activity
- Safety system functional failures

b. Findings

No findings of significance were identified.

40A2 Identification and Resolution of Problems (71152)

.1 Valve PCV-21 Cover Stud and Nut Failures

a. Inspection Scope

The inspectors evaluated an event in which several studs and nuts of the valve cover joint for Atmospheric Dump Valve PCV-21 failed. The inspectors reviewed AR A0540047 and Nonconformance Report N0002134 to support this inspection.

b. Findings

Introduction

An NCV was identified for failure to follow procedures for the torquing of atmospheric dump valve bonnet cover plate studs and nuts. This violation was evaluated by the reactor safety significance determination process and was of very low safety significance (Green).

Description

The atmospheric steam dump valves are designated as Valves PCV-19, -20, -21, and -22 on each unit. The atmospheric steam dump valves are 8-inch air-operated valves located upstream of the main steam isolation valves. They have a combined capacity of 10 percent of rated reactor power. The licensee credits these valves in several design basis accidents and transients. Valve PCV-21 is the Unit 2 Steam Generator 3 atmospheric steam dump valve.

On August 30, 2002, during a tour of the outside areas, an auxiliary operator identified a steam leak at Valve PCV-21. Because of the size and vicinity of the steam plume, the operator concluded that a small test connection near Valve PCV-21 at Valve MS-2-5409 leaked and initiated AR A0540047. The AR review team and the shift foreman reviewed AR A0540047 and, based on the initial information provided, they determined that it need not be repaired or further evaluated in an expedited manner. On August 31, after removing insulation, personnel discovered a broken stud on the bonnet cover plate joint for Valve PCV-21. They contacted a maintenance planner, who directed that they leave the broken stud on a metallurgical engineer's desk, for evaluation. In addition, the insulators updated AR A0540047 with this new information. The metallurgist began his evaluation of the failure mechanism for the stud. Licensee personnel did not forward this updated information regarding the broken stud to management or the control room staff for a new evaluation and prioritization.

On September 6, 2002, the system engineer and the valve engineer examined Valve PCV-21 and noted two split nuts on the bonnet cover plate joint in addition to the missing stud. The system engineer initiated AR A0540479 to have the degraded components evaluated and to further inform operators and plant management. Operators declared Valve PCV-21 inoperable and isolated the valve from the steam line. After further investigation, the licensee determined that six of the eight studs on the

bonnet cover plate joint were cracked or broken. The two intact studs had cracked nuts. Therefore, with all eight of the stud/nut combinations degraded, a substantial potential for common mode failure existed. The licensee initiated Nonconformance Report N0002134 to perform a formal root cause analysis and propose corrective actions to prevent recurrence. The licensee inspected the other atmospheric dump valves to determine the extent of the condition and identified no adverse indications on the other three Unit 1 atmospheric dump valves and all four Unit 2 atmospheric dump valves.

The licensee's root cause analysis identified that embrittlement of the 17-4 pH steel due to high temperature application of the materials (greater than 470 degrees) coupled with suspected overtightening resulted in the failure of the studs and nuts of Valve PCV-21. The licensee performed material property testing and identified a lower yield strength for the studs and nuts of Valve PCV-21. However, this lower yield strength could not be achieved using the maximum torque of 1210 foot-lbs. Therefore, the licensee assumed that the nuts for Valve PCV-21 may have been overtightened during installation on May 13, 2001.

Work Order C0171218 and Maintenance Procedure MP M-51.2, "Ten Percent Atmospheric Steam Dump Valve Maintenance," Revision 12, provided instructions for the mechanics to disassemble, inspect, then reassemble Valve PCV-21. Section 7.5.28 required the user to incrementally torque Valve PCV-21 to 1100 ft-lbs with a calibrated torque wrench and a minimum of three passes. A range of final torque values was given on the data sheet as 990 to 1210 ft-lbs. On May 13, 2001, the day of the valve repair, the mechanics entered N/A as the final torque value for Valve PCV-21 in Work Order C0171218. Following closeout of the work order, on May 23, 2001, the mechanics lined out the N/A in the work order and entered 1210 ft-lbs. In addition, the mechanics added words to the comment section of the work order stating that the nuts for Valve PCV-21 were torqued in three incremental passes at 375, 825 and 1210 ft-lbs. The licensee subsequently closed out the work order.

During interviews with the mechanics that performed the work, the mechanics later stated that they did not incrementally torque the cover stud nuts as stated in the work order. Rather they used a hammer and a wrench extender to tighten the cover stud nuts. After each nut was tightened they stated that they checked the nuts at the final torque of 1210 ft-lbs. In Licensee Event Report (LER) 50-323/2002-001-00, the licensee stated that the cover studs and nuts for Valve PCV-21 failed because of embrittlement caused by stress corrosion cracking and higher than expected stress presumably caused by inadequate administrative controls over the maintenance torquing practices. In addition, the licensee stated in the LER that the licensee believed that the as-left torque of the cover stud nuts for Valve PCV-21 was greater than 1210 ft-lbs. This would explain the lack of adverse indication on any of the 56 other cover studs and nuts on the other seven atmospheric dump valves made from the same material and subject to the same service conditions. Thus, the licensee concluded that the mechanics appeared to willfully deviate from the procedure direction and provide inaccurate documentation of their activities.

Analysis

The inspectors evaluated the as-found condition of the studs and nuts on Atmospheric Dump Valve PCV-21 using the Significance Determination Process. The inspectors determined that the multiple stud and nut failures represented a credible impact on safety in that their failure could have resulted in the body-to-bonnet separation of Valve PCV-21. The failure would have been similar to a failed open atmospheric dump or secondary safety relief valve. The inspectors considered that the failure of the degraded studs would result in a potential loss of the main steam boundary and a direct release path following a postulated Unit 2 Steam Generator 3 tube rupture. Although the condition resulted in a minor steam leak, the licensee completed a metallurgical analysis that demonstrated the remaining studs and nuts had sufficient strength, along with the stud configuration around the valve bonnet, to prevent catastrophic failure of Valve PCV-21. No immediate operability concerns were identified for any of the other atmospheric dump valves. Based on the determination that the valve body and bonnet would not have separated, the inspectors concluded the issue had very low safety significance (Green).

Enforcement

The NRC's Office of Investigations reviewed this issue (Investigative Report OI-4-2002-017) and concluded the event involved a willful violation of NRC requirements. The inspectors determined that Technical Specification 5.4.1.a requires implementation of procedures listed in Regulatory Guide 1.33, Appendix A, Revision 2. Regulatory Guide 1.33, Appendix A, Revision 2, lists procedures for performing maintenance. Work Order C0171218 and Procedure MP M-51.21 partially implement this requirement. Section 7.5.28 of Procedure MP M-51.21 requires torquing of Valve PCV-21 cover stud nuts to 1100 ft-lbs using three passes with a calibrated torque wrench. Contrary to this requirement, on May 13, 2001, mechanics tightened the cover stud nuts of Valve PCV-21 using a wrench extender and hammer. The failure to implement Procedure MP M-51.21 is a violation of Technical Specification 5.4.1.a. However, this Severity Level IV violation is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. Specifically, although this violation was willful, the licensee promptly reported the results of the investigation to the NRC, the acts were committed by low level individuals, management was not involved nor was the action due to lack of management oversight, and the licensee took significant remedial action (EA-02-158). This violation is in the corrective action program as Nonconformance Report N0002134 (NCV 323/02004-03).

.2 Review of Changes to Quality Assurance Program

a. Inspection Scope

The inspectors reviewed a sampling of changes to the Diablo Canyon Quality Assurance Program as found in Chapter 17 of the FSAR Update. The inspection consisted of a review of quality assurance record and interviews with personnel. The following changes were reviewed:

- FSAR Update change request to revise plant staff review committee responsibilities
- FSAR Update change request to revise audit frequencies
- FSAR Update change request to relocate receipt inspection personnel to the procurement department
- FSAR Update change request to revise personnel makeup of nuclear safety oversight committee

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems in Maintenance

a. Inspection Scope

The inspectors evaluated the use of the corrective action system within the Maintenance Rule Program for issues associated with risk-significant systems. The review was accomplished by the examination of a sample of corrective action documents, maintenance work items, and other documents listed in the attachment. The purpose of the review was to establish that the corrective action program was entered at the appropriate threshold for the purpose of:

- Implementation of the corrective action process when a performance criterion was exceeded
- Correction of performance-related issues or conditions identified during the periodic evaluation
- Correction of generic issues or conditions identified during programmatic assessments, audits, or surveillances.

The inspectors determined that the identification of problems and implementation of corrective actions were acceptable.

b. Findings

No findings of significance were identified.

40A5 Other

Evaluation of Diablo Canyon Safety Condition in Light of Financial Conditions

a. Inspection Scope

Because of the licensee's financial condition, Region IV initiated special review processes for Diablo Canyon. The resident inspectors continued to evaluate the following factors to determine whether the financial condition and power needs of the station impacted plant safety. The factors reviewed included: (1) impact on staffing, (2) corrective maintenance backlog, (3) corrective action system backlogs, (4) changes to the planned maintenance schedule, (5) reduction in outage scope, (6) availability of emergency facilities and operability of emergency sirens, and (7) grid stability (i.e., availability of offsite power to the switchyard, status of the operating reserves especially at the onset of rolling blackouts, and main generator Volt-Ampere reactive loading).

Additionally, the resident inspectors observed the energy supply and operating reserves available in the California market. Inspectors have also increased attention to areas such as employee morale, licensee activities, and specific technical issues.

b. Findings

No findings of significance were identified.

40A6 Management Meetings

Exit Meeting Summary

The resident inspection results were presented on October 11, 2002, to Mr. David H. Oatley, Vice President - Diablo Canyon Operations, and other members of licensee management. The licensee acknowledged the finding presented. Discussion of region-based inspection results are described in the following paragraphs.

The radiation protection inspection results were presented to Mr. James R. Becker, Station Director, and other members of licensee management at the conclusion of the inspection on July 25, 2002. The licensee acknowledged the findings presented.

The Maintenance Rule inspection results were presented to Mr. James R. Becker, Station Director, and other members of licensee management at the conclusion of the inspection on August 7, 2002. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information is contained in the inspection report.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Becker, Station Director
C. Belmont, Manager, Nuclear Quality Services
C. Gillies, Director, Site Services
J. Hays, Director, Maintenance Services
R. Jett, Nuclear Quality Analysis and Licensing
D. Miklush, Director, Engineering Services
P. Nugent, Manager, Regulatory Services
D. Oatley, Vice President, Diablo Canyon Operations
P. Roller, Manager, Operations Services
R. Todaro, Manager, Security Services
J. Tompkins, Director, Nuclear Quality Analysis and Licensing
L. Womack, Vice President, Nuclear Services

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

| | | |
|--------------|-----|--|
| 323/02004-01 | URI | Evaluation of failure of CCW Pump 2-3 power supply cable requiring NOED (Section 1R13) |
|--------------|-----|--|

Opened and Closed During this Inspection

| | | |
|--------------|-----|---|
| 275/02004-02 | NCV | Failure to post a radiation area (Section 2OS2) |
| 323/02004-03 | NCV | Willful violation of maintenance procedure when torquing atmospheric dump valve nuts (Section 4OA2) |

Previous Items Closed

None.

LIST OF ACRONYMS USED

| | |
|-------|-----------------------------------|
| ALARA | as low as reasonably achievable |
| AR | action request |
| ASW | auxiliary saltwater |
| CCW | component cooling water |
| CFR | Code of Federal Regulations |
| HSAS | Homeland Security Advisory System |
| kV | kilovolt |
| LER | licensee event report |
| NEI | Nuclear Energy Institute |

| | |
|------|-----------------------------------|
| NOED | Notice of Enforcement Discretion |
| NCV | noncited violation |
| NRC | Nuclear Regulatory Commission |
| OHS | Office of Homeland Security |
| PARS | Publicly Available Records System |
| RIS | Regulatory Issue Summary |
| FSAR | Final Safety Analysis Report |
| URI | unresolved item |

DOCUMENTS REVIEWED

Diablo Canyon Power Plant Maintenance Rule Periodic Assessment, March-April 1998
Diablo Canyon Power Plant Maintenance Rule Periodic Assessment, October 5, 2001
Maintenance Rule Monitoring Program, Procedure MA1.ID17, Revision 9

Action Requests (Corrective Action Documents)

| | | | | |
|----------|----------|----------|----------|----------|
| A0416829 | A0467127 | A0506562 | A0523792 | A0543927 |
| A0434296 | A0472876 | A0508836 | A0524579 | A0545344 |
| A0437390 | A0477251 | A0512317 | A0530522 | A0548053 |
| A0442574 | A0483329 | A0515507 | A0540712 | A0560569 |
| A0444043 | A0489609 | A0519506 | A0541146 | A0560774 |
| A0466272 | A0494251 | | | |